

Apple Marketing in Kashmir: A Case Study of Sopore Fruit Mandi (Terminal Market)

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(2013-A-966-M)



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Technology of Kashmir**

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Apple Marketing in Kashmir: A Case Study of Sopore Fruit Mandi (Terminal Market)

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**The Faculty of Agriculture
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Dedicated

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Sher-e-Kashmir
University of Agricultural Sciences & Technology of Kashmir
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ABSTRACT

The study was conducted in “Sopore Fruit Mandi” owing to the fact that it is the largest terminal market in Kashmir. The type of sampling method applied was random sampling. There were a total of 600 registered fruit growers and out of which 150 fruit growers were randomly selected. An interview schedule was devised as a tool to assess the sources of information, socio economic characteristics and to assess the constraints in the marketing of apple fruit. Data was collected by personal interview method from 150 registered apple growers. Radio, Television, Horticulture Development Officer and Area Marketing Officer were found to be the main sources of information regarding the marketing of apple fruit. Education, experience in fruit growing and sources of information were found to be significantly correlated with the knowledge level of the fruit growers.

Key Words: Interview schedule, Knowledge, marketing, fruit growers, sources of information.

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Signature of Major Advisor
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Place: Bemina Srinagar

Dated: _____

Aftab Ahmad Khan

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Chapter 1

INTRODUCTION

As a dominant crop of the valley “Apple” proudly represents the fruit industry of Kashmir, contributing 98 % of the total fruit production. Between 1974-75 and 2008-09, the area under apple has gone up from 46190 to 1332810 hectares (Bhat, 2012). Kashmir apple has lived up to its reputation for being one of the choicest fruits. Kashmir has for long been considered the home of apples. A number of apple varieties are found indigenous to the state of which Ambri is “Par excellence” in quality. Amongst all other fruit crops apple has found a better reception with the growers due to its high prices and ability to stand transportation. The marketing of Apple is a complex phenomenon. The marketing pattern of apple is different from other agriculture commodities. The apples are brought to the wholesale markets near the production area and then supplied from there to the terminal markets. The dispersion process in case of apple is in the opposite direction. The produce is first sent to the terminal market from the producing area and then distributed to the primary and secondary markets. Consequently, a large number of middlemen are involved in the channels of trade between the apple producers and the consumers. There is also an evidence of collusion amongst the apple merchants to control apple prices within the market and to influence pricing in other market. The marketing system for apple is therefore, of utmost importance for those growers who specialize in apple production and of great importance to all those people who are concerned with the producer’s share in the consumer’s price. Apple marketing in the valley virtually in its entirety is carried out by the private sector comprising of pre-harvest contractor, forwarding agents, commission agents, wholesalers and retailers. It is claimed that collusion among middlemen and exploitation of weaker producers is common practice. Apple marketing being complex at present requires special treatment and utmost care in the Kashmir Valley. Due to powerful intermediaries in the marketing system, present marketing has an inherent tendency to give more

benefits to these intermediaries at the cost present marketing structure is such that activities are solely performed by these powerful intermediaries. Marketing is a wider concept and deserves careful attention towards pre-harvest and post-harvest technologies and operations. Generally in the country and particularly in the state, when a grower enters into agri-business, he has to follow the market oriented modern sophisticated pre-harvest and post-harvest operations accessible and affordable at his own level. Other forwarding agencies should have to follow the same strategies (Bhat, 2012).

Apple was introduced into the country by the British in the Kullu Valley of the Himalayan State of H.P. as far back as 1865, while the coloured 'Delicious' cultivars of apple were introduced to Shimla hills of the same State in 1917. The apple cultivar "Ambri", is considered indigenous to Kashmir and had been grown long before Western introductions. Over 700 cultivars of apple, introduced from USA, Russia, U.K., Canada, Germany, Israel, Netherlands, Australia, Switzerland, Italy and Denmark have been tried and tested during the last 50 years (Bhardwaj, 2012). India produces all deciduous fruits including pome fruits (apple and pear) and stone fruits (Peach, plum, apricot and cherry) in considerable quantity. These are mainly grown in the North-Western Indian States of Jammu and Kashmir (J&K), Himachal Pradesh (H.P.) and in Uttaranchal. The North-Eastern Hilly region, comprising of the States of Arunachal Pradesh, Nagaland, Meghalaya, Manipur and Sikkim also grow some of the deciduous fruits on a limited scale. Out of all the deciduous fruits, apple is the most important in terms of production and extent the delicious group of cultivars predominates the apple market. The area covered under delicious cultivars is: 83 % of the area under apple in H.P., 45 % in J&K and 30 % in Uttaranchal. In more recent times, improved spur types and standard colour mutants with 20-50 % higher yield potential are favoured. In Himachal Pradesh monoculture of a few cultivars such as Royal Delicious, Red Delicious and Richa red have started showing negative impact on the apple industry. Serious problems like apple scab disease and outbreak of premature leaf

fall and infestation of red spider mite are causing great concern. Uttaranchal, particularly the Kumaon hills division, has the unique advantage of early harvest of apple, mainly due to cultivation of early maturing varieties like Early Shanburry, Fanny and Benoni. The early maturing varieties are harvested 2-3 weeks before the arrival of fresh apple from H.P. and J&K, and hence fetch very remunerative prices. Strong economic growth is projected to lead to continued expansion of Indian apple demand, but the high cost of domestic and imported apples compared with other Indian fruit is likely to limit consumption to higher income consumers. U.S. apples have accounted for the largest share of Indian imports, but face increasing competition from high-quality and low-cost Chinese apples. Although India has a high tariff on imported apples, internal marketing margins-or returns to traders over and above measured costs-account for a significantly larger share of consumer apple prices than do import prices, tariffs, or marketing costs. As a result, increased investment and competition in the domestic supply chain is likely to be particularly effective in boosting apple demand and imports. After achieving self-sufficiency in the production of food grains, the Government of India laid special emphasis on the production of horticultural crops. India is endowed with varied agro-climates, different soil types and natural resources, which confer a competitive edge in production and marketing making the produce available for export over an extended period. Horticulture produce contributes to 29.5 % of our agricultural gross domestic product from 8.5 % area and 10 % of the total agriculture export earnings. India is the second largest producer of fruits in the world with an annual production of 47.5 million tonnes from an area of 4.0 million hectares and contributes to more than 10 % of world fruit production. In spite of this the exported quantity as a percentage of production is very less.

India's diverse climate ensures availability of all varieties of fresh fruits & vegetables. It ranks second in fruit and vegetable production in the world, after China. As per National Horticulture Database published by National Horticulture

Board 2012-13 India produced 81.285 million metric tons of fruits and 162.19 million metric tons of vegetables. The area under cultivation of fruits stood at 6.98 million hectares while vegetables were cultivated at 9.21 million hectares

The state of Jammu and Kashmir comprising of temperate cold arid and hilly areas is located in north western region of India and faces more complex problems in agriculture development than in plains due to extreme agro climatic conditions topographic situation and numerous other factors. Jammu and Kashmir is known as temperate fruit bowl of India and is bestowed by nature by numerous fruit varieties (Delectious, Maharaji Hazratbali Razakwari Kesari and others) in considerable quantity. In majority of the cultivable varieties of apple were introduced by British officers way back in 1866. The horticulture sector of Jammu and Kashmir is spread over an area of 3.70 lakh hectare with an annual production of 19.13 lakh metric tons. Apple from Kashmir occupies the dominant position and holds about 70.39 of the total apple production in India (Greater Kashmir, 07-2014).

Marketing is a comprehensive function; it is concerned with every aspect of produce from its inception, design, pricing, selling, distribution until it reaches the final hands of consumers, it involves all the activities including the creation of time, place, form and possession utility. American marketing association defined marketing as performance of business activities that directs the flow of goods and services from producer's to consumers..

It has been observed in the research areas that maximum growers do not follow market oriented pre-harvest operations as advocated by research scientists in their transfer of technology programme to improve the quality of produce in Kashmir Valley. Apple growers are production oriented rather than market oriented. In most cases they follow what other are doing as a result scarcity or glut of commodity exists in market resulting lower profits in comparison with other apple producing states like Himachal Pradesh, Uttaranchal etc. The present study will be of great utilitarian value for further improvement in marketing of apple

fruit aimed at generating more economic returns. The findings of the study and inference drawn can be generalized for whole valley moreover the constraints faced by the farming community will help us in reshaping the research, extension and needed infrastructure. Hence to comprehend various aspects of marketing prevailing in sopore fruit mandi, the study was made with following specific objectives.

Objectives of the study

- To study the socio-economic characteristics of apple growers.
- To evaluate sources of information for marketing decision of apple.
- To study constraints faced by apple growers in marketing and options for policy implications.

Chapter 2

BRIEF RESUME OF THE WORK DONE

Dunham (1994) reported that the marketing bill or the portion of consumer food expenditures that did not return to the farmer but goes to the packing, storing, distributing and retailing of food was \$382.1 billion dollars which was more than triple the farm value of \$109.2 billion from a total of \$491.3 billion for food expenditures.

Jeffers (1998) reported that “the food sector of the economy was second only to the pharmaceutical sector in terms of return on investment but the economic benefits were not shared equally by all portions of the food sector”. For example in 1979, farmers are received 13 % less for every consumer dollar. The 1997 Agriculture Fact Book (as cited in USDA, 1998) stated that in 1980 farmers received 37 cents out of every food dollar, but by 1997 their share had dropped to 23 cents out of every food dollar.

Hewett (2003) reported that in the current environment, the most powerful actors in the chain – the retailers, tend to dominate supply chains. Most retailers switch volumes between suppliers and buy at prices that will make them a profit. It was also reported that the growers with an independent mind-set, sell their products to agents offering the best price.

Duffy (2005) reported that due to the perishable nature of the product and their need to sell in order to capture any return, suppliers are often forced to accept low prices to get volume growth, which does little to improve their immediate or long-term financial performance. Retailers have also been able to hold the balance of power in the chain because growers tend not to take a strategic standpoint and collaborate for long term gain and opportunity.

Clements *et al.* (2008) revealed that the ability to provide customers with fresh, high quality fruit when products are perishable and fragile implies good logistics and procedures along with good information flow from growers to

supermarkets and vice versa in other words a value chain of activities stretching from breeding and production through to consumer.

Bharadwaj *et al.* (2012) revealed that the majority of commission agents of Azadpur Mandi got apples through farmers directly and pay them money three or four months before the season of apple in advances and the Credit sale was common in this market. It was reported that farmers were facing the problem of high cost of packing materials, high cost and non-availability of transportation facility, poor connectivity of farm to main road, problem of storage, and malpractices by market functionaries and lack of market intelligence. It was recommended that Government has to take initiatives to improve the infrastructure, conduct capacity-building programs and finally facilitate the availability of market information and good quality packaging material. It was also suggested that auctioning should also be conducted in transparent manner and further revealed that the market functionaries were facing the problems of poor grading of apples, breach of contract from farmer's side, problem of credit recovery, bed debt etc. in the market.

Bhat (2012) reported that the dominance of commission agents and hegemony of intermediaries was not allowing the markets to be organized. Moreover, the apple markets are not properly regulated as per the institutional frame work so that the concept of "minimum price support programme" gets implemented and the fruit growers are benefited and market risk, minimized. It was also reported that marketing is mainly made by commission agents on the principle of "Watak" and "Hatha" System at the different fruit mandies of the country which is universally objectionable in general and in the research area in particular because a number of malpractices are related to it e.g. the unnecessary commission and charges written in the "Watak" as Charity, Trade union commission etc. and in Hatha System" System rate determination of produce where grower fails to understand the philosophy of the negotiation by the commission agent and trader at the mandi when a "Golden Handshake" is made

by the two under a piece of cloth. It was further revealed that the problem of proxy grading was responded by growers positively. It is practiced by some growers in a way that under the A-grade layer, B-grade apple is packed which in turn affects the general quality and return of produce.

Wani *et al.* (1993) made a study on economic analysis of different age orchards in apple in J&K. This study examines the costs, returns and economics of different age categories of apple orchards in Jammu and Kashmir. Investment in apple orchards is profitable. Cultivation is labour intensive and helps to generate much employment. Net returns from apples can be increased if marketing problems are taken care of and extension services strengthened to educate farmers about proper input use.

Prasher *et al.* (1996) made an economic analysis of apple cultivation in tribal belt on North-Himalayan region. Marketing channels and price spread, and apple growers marketing problems were studied. Apple cultivation in the tribal belt is a remunerative and employment generating activity. It was also reported that growers were facing problems that include shortage of skilled labour and high wages, shortage of packing material and lack of shortage and transportation facilities.

Thakur D.S. (1973) made an attempt to study pricing market efficiency of the Indian apple market in Himachal Pradesh. He found the general wholesale commercial varieties of apple show a rising trend in apple production in almost all large markets. There is wide variation among the prices of different varieties and also in the trend price of the same variety in different markets. Apple prices are characterized by wide fluctuations over time and space according to the position of arrivals and stocks in the market and the variation in weather and demand for outstation dispatches. The cost of apple marketing is high enough and the apple growers get generally less than 50 % of consumer's price. It is more profitable to send apple in distant markets of country than in markets situated near production area. This study show that marketing system for apple in India is fairly integrated

so far as inter market price movements are concerned, but it is observed that traders profit margin account quite large proportion of price paid by consumer, which show symptom of inefficiency.

Atteri and Ray (1992) analyzed the impact of Himachal Pradesh Horticultural Produce Marketing Corporation on the wholesale price behavior of apple spectral approach. Paper considers the role of Himachal Pradesh Horticultural Marketing Corporation (HPHPMC) in improving the stability of wholesale prices for apple in the market of Calcutta, Delhi and Madras. A spectral analysis approach to time series data on prices is undertaken for each of three markets, with data divided into two periods (before and after the inception of HPHPMC). The results of the study indicate that six month seasonal cycles were present in all three markets in both periods. The paper concludes that there is need to stabilize apple prices. This is to be achieved by increasing the flow of information to different markets and encouraging more construction of cold storage facilities.

Kainth (1994) studied apple consumption in urban areas of Indian Punjab, consumer preference and factors affecting apple consumption. Data were collected from 400 households (1520 consumer respondents of which 834 were male and 686 female). Households were classified according to five income groups. Large apple size was most popular with poor, lower middle and middle class groups, whereas very large apple size was not popular with upper and rich classes. In general, red was most popular colour. Apple consumption elasticity was inelastic with respect to family size, family education and disposable income.

Saraswat (1994) presented a study on the marketing of Himachal apple in Delhi. The paper investigation showed (1) trends in area and production of various fruits in Himachal Pradesh state, India; (2) the marketing system for apple; (3) marketing problems faced by the apple grower in Kiari village. The stages involved in apple market include picking, grading, packing and transportation. Apple production had increased greatly during the last two

decades. However, there are many problems which need to be resolved in the marketing system. Marketing margins are quite high at both the Mashakhor and retail level.

Wani *et al.* (1995) analysed the resource-use and economic efficiency of various marketing cost components in apple based on sample of 30 producers in block Bandipora of Baramulla district of J & K. The allocation of the marketing cost is also examined in this study. The findings of the study depicted that grading, packing and transportation costs accounted for the largest amount of expenditure by the apple producers. The lowering of the packaging cost is suggested by finding a substitute for wooden packaging. The excessive transportation costs prevent marginal and small apple producers from sending their crop directly to the market.

Negi *et al.* (1997) conducted a study on the marketing of Himachal apple, over spec and time. The study is based on the secondary data which reveals that marketing efficiency has declined over time in terms of producer's net share leading to an adverse impact on the producer welfare in particular and state economy in general. Broadening the market will improve producers welfare but selling in distinct markets would require transit efficiency and market intelligence besides a prior detailed market study to determine cultural and consumer profile advantages for effective market regimentation.

Singh and Chauhan (1998) conducted a study on the role of cooperatives in organizing production and marketing of apple produce in HP. The society selected is Shathla Premal Cooperative Fruit Growers Marketing Society Limited. It is the most successful society in organizing production and marketing of fruits (apple) in northern India. The main function of the society is to arrange the supply of inputs and also supply consumer goods to its members on their requirement. The other functions are to provide and arrange the transport of produce of its members, arrange for credit advances and also the dissemination of market intelligence over years.

Mai-Chand (1997) analyzed constraint of tribal farmers of HP during the adoption of improved apple cultivation. 60 farmers from three villages of tribal district of Kinnaur, HP, were surveyed in 1994. They perceived 34 items to be constraints in the adoption of improved apple cultivation practices. The items of the constraint index were developed in consultation with researchers, extension personal and progressive farmers and were grouped into four categories (inputs, production, marketing and technical guidance). Unavailability and high cost of inputs were cited as constraints to adoption of improved apple cultivation practices in 51.67 % of cases. Other important input related constraints were timeliness arrival of inputs, poor quality of inputs, inadequate credit facility and complicated credit procedure. The results of the study reported that uncertainty of weather, which caused early and poor fruit setting was the highest (70%) ranking production constraint, followed by lack of irrigation facilities (56.67 %), higher labour cost (55 %), small land holding (51.67%) and fruit drop (48.33%). The most important marketing constraints were road blockade at the time of transportation (50%) and unavailability of markets (48.33%), while lack of guidance regarding selection of appropriate cultivars (48.33%), fertilizers application (43.33%) and utilization of culled fruits (43.33%) were the highest ranking technical constraints.

Tronstad *et al.* (1992) analyzed that the marketing concepts associated with, quality, location and time are integrated into a complete model, revealing the linkages between market window approaches and hedonic analysis. An integrated hedonic price model for apple industry was estimate during monthly average price data for 1882-89. Results suggest that size storage method grade and seasonally are the most important influences on the price of apple and thus offer the most promising areas for enhanced returns to growers. Area of apple origin and variety were the least important influences on apple prices, with the exception of Granny Smith variety.

Leyrer (1993) conducted a study on future fruit marketing of apples. The paper deals with the marketing of apples produced in Germany. Apple production over the Europe as a whole was increased slightly in the 1990's particularly in Germany, Netherlands and Belgium with the slight reduction in France and with a greater decrease in other countries. The researcher found that 65% of German apples are retailed through super markets, 15% from weekly markets, 15% direct from orchard or roadside and 5% through specialist shops. About 50 to 60 % of production through an increasingly concentrated wholesale sector.

Carvalho *et al.* (1997) studied the economic importance of commercialization and post-harvest operation for productive chain of Brazilian apple. For the home market, the commercialization segments accounts for 50.33 percent were attributed to production. For the overseas market, cost proportions changed to 80.02 % and 17.98 % respectively.

Grimster (1997) presented a report on the tropical fruits market. The report gives an overall market guide of wholesale market prices for avocado, Carambola, coconut, durian, fog, guava and star apple sold in Australian wholesale markets over the period of January 1994 to December 1996.

Love (1997) identified the variables which can be used for forecasting fresh apple prices for selected months in the marketing season in USA. The price of fresh apple in the USA in three months (November, February and May) indicates the season's overall performance. Fresh apple prices can be predicted for 3 months using 3 different variables (1) Estimated US production, (2) an estimated early season price and (3) late season stocks in cold storage

Kiss and Kahaber (1992) investigated the profitability of apple storage. They found that returns to apples stored do not differ to those obtained from apples sold immediately in Hungarian market. As a result investment, in storage facilities has not been maintained. The prices of apple held in store should therefore be increased.

Marimuthu and Radhakrishnan (2000) found that, among the personnel cosmopolite sources Assistant Horticulture officer served as a source of all, followed by Agriculture officers (70%) bank officials (65%), followed by Horticulture officers. Regarding personnel localite sources of information most of the banana growers utilized relatives (78%) friends (65%), input dealers (60%), and followed by neighbors. Among impersonal cosmopolite sources most of the farmers utilized television (65%), Radio (56%), followed by exhibitions.

Shinde (2001) reported that among the extension personals village extension workers (17.78%) were often used and Agriculture officers(15.55%), were sometimes used as sources of information , among local personal one third of the respondents contacted neighbours (33.33%) and relatives (32.78%), as source of information.

Chandershekhra (1999) found that majority of the coffee 58.50 % had low extension participation, 22.50% of them were medium extension participation and only 19.00% of coffee growers had high extension participation.

Sawarnakar and Agrawal, (1999) reported that, the rural agricultural scientist and scientist and friends were most popular sources for utilization of information sources. Demonstration, television and radio were the most effective channels reported by the majority of the respondents for information source information.

Singh *et al.* (2003) found that , sources like progressive farmers, friends, neighbours, relatives were most frequently used, whereas advisory letters, farmers tours, agricultural exhibitions, and demonstrations were the least frequently usrd modes for acquisition of farm technology.

Chapter 3

MATERIALS AND METHODS

The materials and methods used in this study are presented in the following subheads:

- 3.1 Locale of the study
- 3.2 Selection of the respondents
- 3.3 Agro-climatic background
- 3.4 Construction of Interview Schedule for data collection
- 3.5 Pre-Testing of Interview Schedule
- 3.6 Procedure for Data Collection
- 3.7 Operational definitions
- 3.8 Statistical Analysis

3.1 Locale of the study

On the basis of research of the problem and its objectives the present study was conducted in North Kashmir in district Baramullah of Jammu and Kashmir where Sopore fruit mandi was selected to study Apple marketing in Kashmir as a case study.

3.2 Selection of the respondents:

A list of the respondents (registered fruit growers) was obtained from the Fruit growers' association of the concerned district. Out of total number of 600 registered growers, 150 registered fruit growers (20% of the total registered fruit growers) were taken for the study.

3.3 Agro-climatic background.

Baramulla district is largest in the entire valley both with reference to the population and area. Baramulla district is bounded by Kupwara district in the north, Budgam and poonch in the south, parts of Srinagar and Ladakah in the east. Baramulla district has severe cold in winter and pleasant whether in summer. Annual rain fall in the district is usually registered 1270 mm. Soil in hilly areas is infertile but in the plain areas it is fertile about 83.05% of the population lives in

villages and 16.94% in urban areas. Crops like paddy maize pulses grow in abundance. In addition to this the district is also rich in fruit growing, The district is spread from Srinagar district and Ganderbal district in the east to the line of control in the west and from Kupwara district in the north and Bandipore district in the northwest to Poonch district in the south and Badgam district in the southwest. Baramulla city is located on the banks of Jhelum river at the highest point of the river. The district is located between 33 degree to 44 degree North latitude & 75 degree to 96 E Longitudes. Average annual rainfall in District Baramulla has been recorded as 1270 mm. The major agriculture & horticulture crops are Rice, maize, pulses, vegetables, apple, pear, apricot, peach, cherry and olive.

3.4 Construction of Research Schedule for data collection

An Interview Schedule was constructed based upon the objectives, variables and available literature on the topic. The schedule was prepared in English language. While preparing the schedule, due care was taken to avoid questions with dual meaning and contradictory statements. The language used for the questions was simple for easy understanding. In this way the research schedule was constructed to collect the necessary information. Interview schedule was divided into two parts- part A and Part B. **Interview Schedule Part A.** It consists of two parts. Part I dealt with the profile of the registered fruit growers. In part II of the Schedule, questions related to various sources of information for decision making and marketing practices were included. Part B included the items related to the constraints faced by the registered fruit growers in adoption of recommended marketing practices in apple fruit.

3.5 Pre-Testing of Interview Schedule

Before, finalization of the schedule, it was pre-tested by interviewing ten members who were not included in the sample in order to know whether the respondents furnish the required information and whether the questions were clear and can be easily understood by the respondents. The ambiguous questions were modified so that no practical difficulties arise while filling the interview schedule.

3.6 Procedure for Data Collection

The author personally interviewed the respondents included in the sample. The help of concerned Area marketing officers (AMOs) was sought for obtaining the list of registered fruit growers. The importance and objectives of the study were clearly explained to all the registered apple growers. They were assured that all the information furnished by them will be kept confidential and would be used for the research study only.

The author attempted to contact the registered apple fruit growers at fruit mandi, Sopore during their leisure time and some farmers were also contacted at their homes to get the information. The interview was conducted in a friendly and informal manner.

3.6.1 Duration of field study

The data collection work was started in the 1st week of October, 2015 and completed by the 1st week of November, 2015. The total period required for this purpose was one month.

3.6.2 Compilation of data

The qualitative data was quantified by using various statistical tools and working out different scores in order to find out the nature of association between dependent and independent variables

3.7 Operational definitions

3.7.1 Independent Variables

3.7.1.1 Age

It is one of the basic characteristic of an individual linked with his maturity, physical fitness and productivity. At the time of interview, chronological age was considered. The respondents according to age were classified into three categories based on mean \pm standard deviation method.

- | | | |
|-----------------------|---|---------------------|
| a. 38 years and below | - | Low (Young) |
| b. 39 to 55 years | - | Medium (Middle Age) |
| c. Above 56 years | - | High (Old Age) |

3.7.1.2 Education

The level of formal education attained by an individual tends to influence the extent to which an individual is exposed to new ideas and outer world. According to formal education, the respondents were classified into following categories.

- a. Illiterate
- b. Middle
- c. Matric
- d. 10+2
- e. Graduate
- f. Graduate and above

3.7.1.3 Family Size

The size of family refers to the total number of members in the family. The members were classified into three categories.

- a. 6 members and below - Low
- b. 7 to 10 members - Medium
- c. Above 11 members - High

3.7.1.4 Annual Income

This includes the annual income of the registered apple growers from agriculture and all other sources. According to their level of income, apple growers were classified into three categories.

- a. Rs 140000 and below - Low
- b. Rs 140001 to Rs 260000 - Medium
- c. Rs 260001 and above - High

3.7.1.5 Land Holding

The land holding refers to the total land possessed by an individual apple grower. According to the extent of land possessed by them, the registered growers were classified into three categories by using suitable scale with slight modification.

- a. 1.3 hectares and below - Low

- b. 1.3 to 2.65 hectares - Medium
- c. 2.66 hectares and above - High

3.7.1.6 Experience in apple fruit growing

Experience means the number of years for which the registered grower has been producing apple fruit. As per their experience in fruit growing, the registered growers were classified into three categories.

- a. Upto 13 years - Low
- b. 14 to 27 years - Medium
- c. 28 years and above - High

3.7.2 Dependent Variables

3.7.2.1 Sources of Information

The source of information refers to the use of different sources by the registered apple growers for obtaining information regarding apple fruit marketing Practices. Ranking of the various sources of information was done by working out the frequency and percentage of each of the registered apple growers availing different sources of information for various market related practices regarding the apple fruit.

3.8 Statistical Analysis

The data collected was processed, quantified, categorized and tabulated. The established parameters like frequency, percentage, regression analysis descriptive statistics and Karl Pearson’s product movement correlation coefficient were calculated.

3.8.1 Mean

This measure was used to categorize the dependent and independent variables into low, medium and high categories. Mean is defined as the arithmetic average of distribution of scores. It is determined by adding the scores and dividing the sum by the number of scores. Symbolically, the mean is given by

$$X = \sum_{i=1}^n \left(\frac{Xi}{n} \right)$$

where,

\bar{X} = Mean Score

X_i = Score for the respondents

n = Total number of respondents.

3.8.2 Frequency distribution of apple fruit growers

Frequency was used to know the distribution pattern of respondent's on different variables and to categorize the problems perceived by fruit growers in order of importance. The frequency distribution of the fruit growers has been worked out and expressed in terms of percentage as well.

3.8.3 Percentage

It is used in descriptive analysis for making simple comparison. For calculating percentage, frequency was multiplied by 100 and divided by the total /number of observations or respondents in that particular category. Percentage was calculated upto 2 places of decimal and in some cases rounded up to the nearest whole numbers.

3.8.4 Karl Pearson's Product Movement Correlation

Karl Pearson's product movement correlation coefficient (Simple correlation coefficient) was employed as to assess the relationship between the dependent and independent variables. The Microsoft Excel Software were used for this Statistical analysis of the data.

3.8.5 Regression analysis

Regression analysis was carried out to determine whether the relationship between the dependent variable and the rest of the independent variables is significant or non-significant.

3.8.6 Descriptive statistics

This statistical technique was adopted in order to find out the standard deviation, minimum and maximum values, range, standard error and mean of variables.



Figure 1: Map showing the location of study area

Chapter 4

EXPERIMENTAL FINDINGS

The prime objective of this investigation was to evaluate the sources of information of recommended apple marketing practices of the registered fruit growers. Keeping in view the specific objectives of the investigation, the data was collected and processed through the tools of statistical analysis. The results are presented and discussed in this chapter under the following headings:

- 4.1 Personal and socio-economic characteristics of the registered fruit growers.
- 4.2 Sources of information
- 4.3 Constraints encountered by the registered apple fruit growers

4.1 Personal and socio-economic characteristics of registered fruit growers.

4.1.1 Age

The responses on age were collected in chronological years and results are presented in Table 1 which shows that, 56.66% of the registered fruit growers belonged to middle age category followed by young age category (26.00%) and old age category (17.34%).

4.1.2 Education

It is evident from Table 1, 31.33% of the registered fruit growers had 10+2 level of education while 24.00% had matric qualification, 18.67% of the fruit growers had middle level qualification and 14% of the registered fruit growers were illiterate. A small percentage (7.33%) of the registered fruit growers was graduate and only 4.67% were educated upto graduate and above.

Table--1 Personal and socio-economic characteristics of registered Apple fruit growers

S. No	Characteristics	(N=150)	
		Frequency	Percentage
1.	Age		
	Young (up to 38 years)	39	26.00
	Middle Age (39-55 years)	85	56.66
	Old Age (55 years and above)	26	17.34
2.	Educational Qualification		
	Illiterate	21	14.00
	Middle	28	18.67
	Matric	36	24.00
	10+2	47	31.33
	Graduate	11	7.33
	Graduate & Above	07	4.67
3.	Family Size		
	Small (up to 6 members)	44	29.33
	Medium (7-10 members)	73	48.67
	Large (above 11)	33	22.00
4.	Annual Income (Rupees)		
	Low (up to 140,000)	59	39.33
	Medium (140001-260000)	77	51.33
	High (above 260001)	14	9.33
5.	Land Holding		
	Small (up to 1.3 hectare)	90	60.00
	Medium (1.4- 2.65 hectare)	44	29.33
	Large(above 2.66 hectare)	16	10.67
6.	Experience in Apple farming		
	Low (up to 13 years)	76	50.66
	Medium (14-27 years)	70	46.66
	High (above 28 years)	04	02.66

4.1.3 Family Size

Table 1 indicates that in Sopore fruit mandi, 48.67 % of the registered apple growers had medium family size (7-10 members) while 29.33% of the registered fruit growers had small family size (up to 6 members) and only 22.00% of the registered fruit growers belonged to the large family category (above 10 members).

4.1.4 Annual Income

It was observed from analysis of the data as shown in Table 1 that majority 51.33 % of the registered apple growers had an annual income of Rs 1,40,001-Rs 2,60,000 whereas, 39.33 % of the registered apple growers had annual income of up to Rs 1,40,000 followed by 9.33 % of registered apple growers had annual income of above Rs 2,60,001.

4.1.5 Land Holding

The data revealed that majority (60.00%) of the registered apple growers had small land holding (below 1.3 hectare) followed by 29.33% having medium land holding (1.4-2.65 hectare) and (10.67%) of the registered apple growers were having large land holding (more than 2.66 hectare).

4.1.6 Experience in Apple fruit growing

Experience in fruit growing means the number of years over which the registered fruit grower has been producing apples in his orchard. Experience in fruit growing is calculated in years.

It is indicated in Table 1, that majority of 50.66% of the registered apple growers had low experience in apple growing (up to 13 years), while as 46.66 % of the registered apple growers had medium experience in apple growing (13-27 years). A small percentage (2.66%) of the registered apple growers had high experience in apple growing (28 and above years).

4.2 Sources of information

Table 2 revealed that majority 92.00% of the registered apple fruit growers availed radio as their major source of information followed by Television (72.66%), Horticulture development officer (69.33%) and Area marketing officer

(60.00%). Neighbours (43.33%), Krishi vigyan Kendra (40.00%), ICT tools (36.66%), Kisan Mela (36.00%), Progressive farmer (33.33%), Newspaper (22.00%), Farmer's friend (20.00%) and University Scientists (10.66%) were the other important sources which were availed by the registered fruit growers to get the necessary information related to the marketing of their produce and accordingly ranks were assigned to different sources of information.

The results in Table 3 clearly indicated that relationship of knowledge level with the two independent variables namely education, experience in fruit growing were significantly associated. Obviously education, experience in fruit growing have helped the registered fruit growers to acquire knowledge and exposed to new technologies and their urge to know the new things in apple marketing which have significantly contributed in adoption. Other variables namely age, family size, annual income, were not significantly related to the knowledge level of respondent

In table 4 it is clearly indicates that relationship of sources of information with the two independent variables namely education, experience in fruit growing, land holding and annual income were significantly associated. Obviously education, experience in fruit growing and have helped the registered fruit growers to acquire knowledge and exposed to new technologies and their urge to know the new things in apple marketing which have significantly contributed in adoption. Other variables namely age, family size, were not significantly correlated.

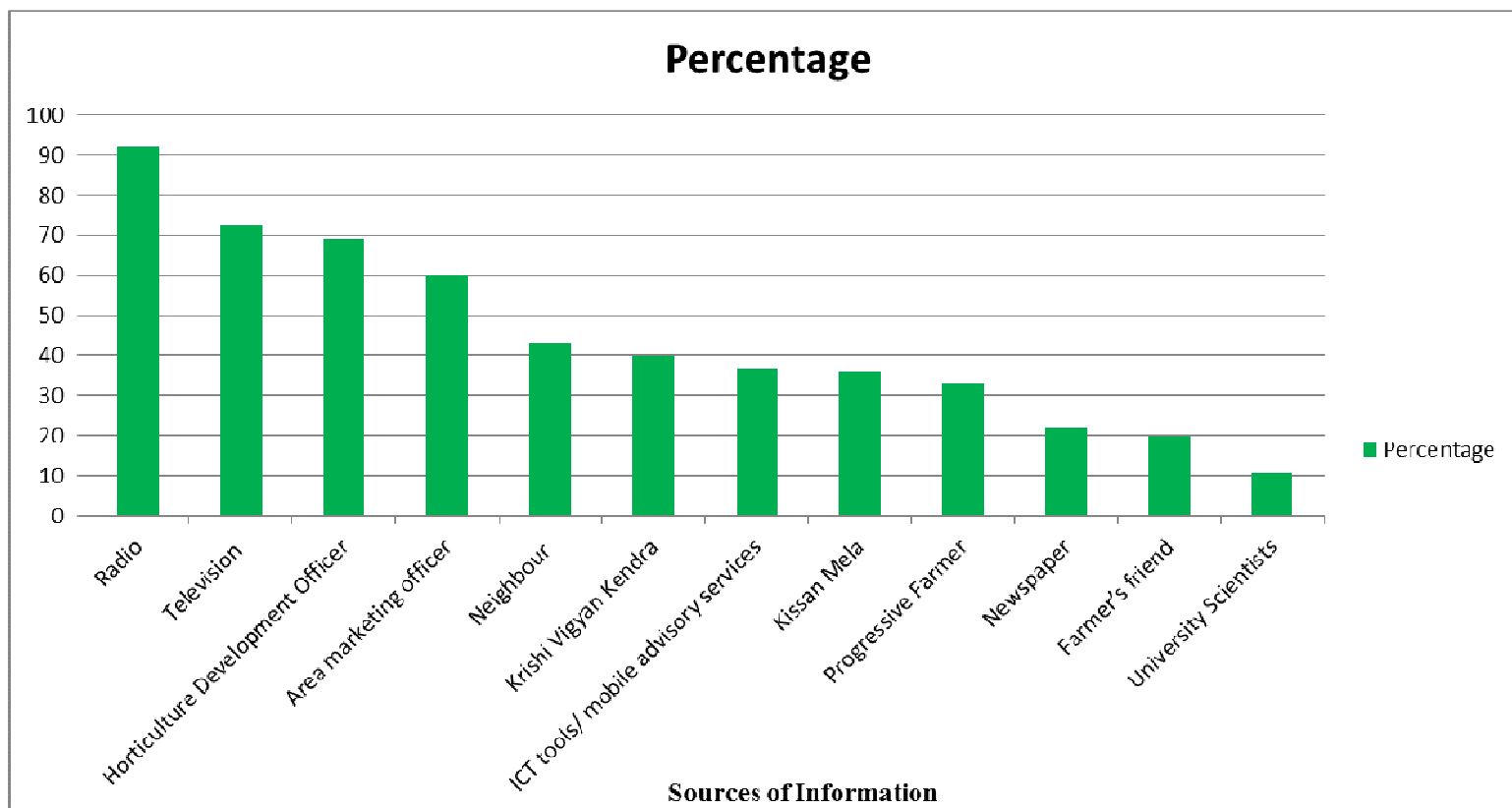


Figure--2. Bar chart showing the role of different sources of information in apple marketing

Table-- 2 Ranking of various sources of information

S. No	Sources of information	Frequency	Percentage	Rank
1	Radio	138	92.00	I
2	Television	109	72.66	II
3	Horticulture Development Officer	104	69.33	III
4	Area marketing officer	90	60.00	IV
5	Neighbour	71	43.33	V
6	Krishi Vigyan Kendra	60	40.00	VI
7	ICT tools/ mobile advisory services	55	36.66	VII
8	Kissan Mela	54	36.00	VIII
9	Progressive Farmer	50	33.33	IX
10	Newspaper	33	22.00	X
11	Farmer's friend	30	20.00	XI
12	University Scientists	16	10.66	XII

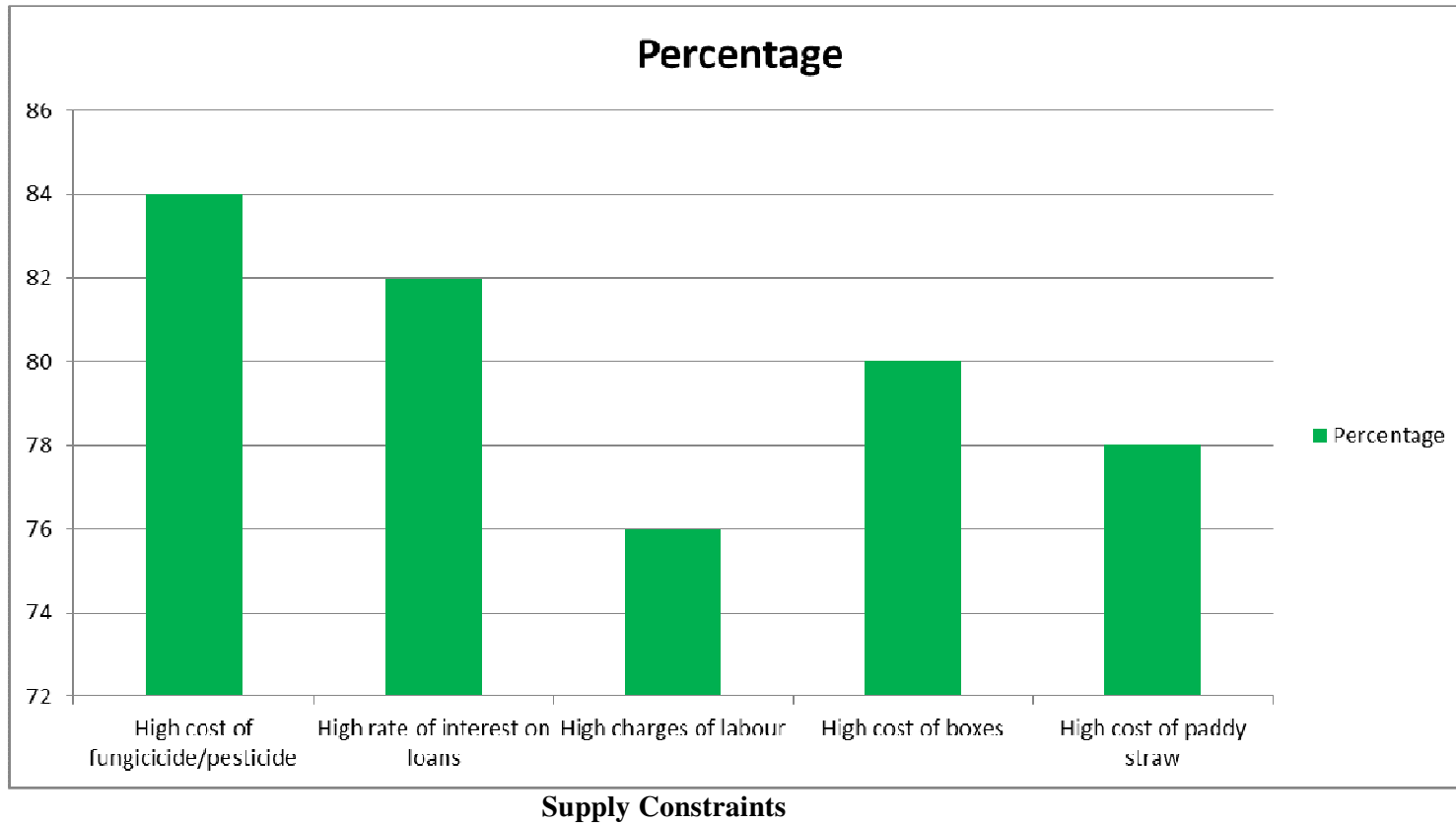
Multiple responses

Table-- 3 Relationship between personal, socio-economic characteristics and Knowledge level of the registered Apple fruit growers

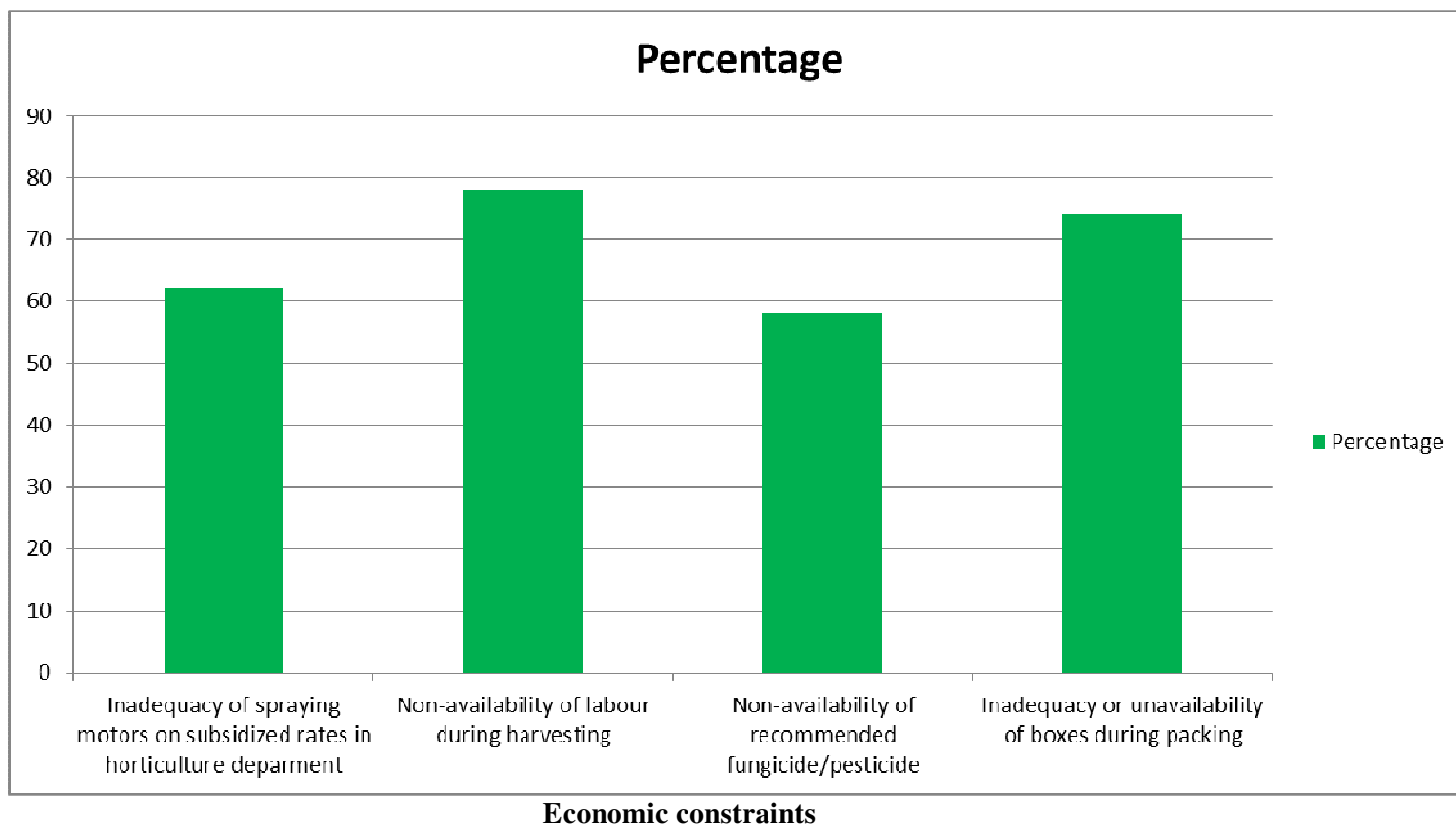
Socio-economic Characteristics	Coefficient of correlation (r)
Age	0.7195
Family Size	0.3354
Annual Income	0.7691
Land Holding	0.6441
Experience in apple farming	0.0007*
Educational Qualification	0.0008*
Multiple responses	

Table-- 4 Relationship between personal, socio-economic characteristics And sources of information of registered apple fruit growers

Socioeconomic Characteristics	“r”
Age	0.5677
Family Size	0.3244
Annual Income	0.0008*
Land Holding	0.0079*
Experience	0.0007*
Educational Qualification	0.0009*
Multiple responses	



Figure—3 Level of hindrance by various supply constraints in marketing of apple



Figure— 4 Level of hindrance by various economic constraints marketing of apple

4.3 Constraints encountered by the registered apple fruit growers

4.3.1 Economic Constraints

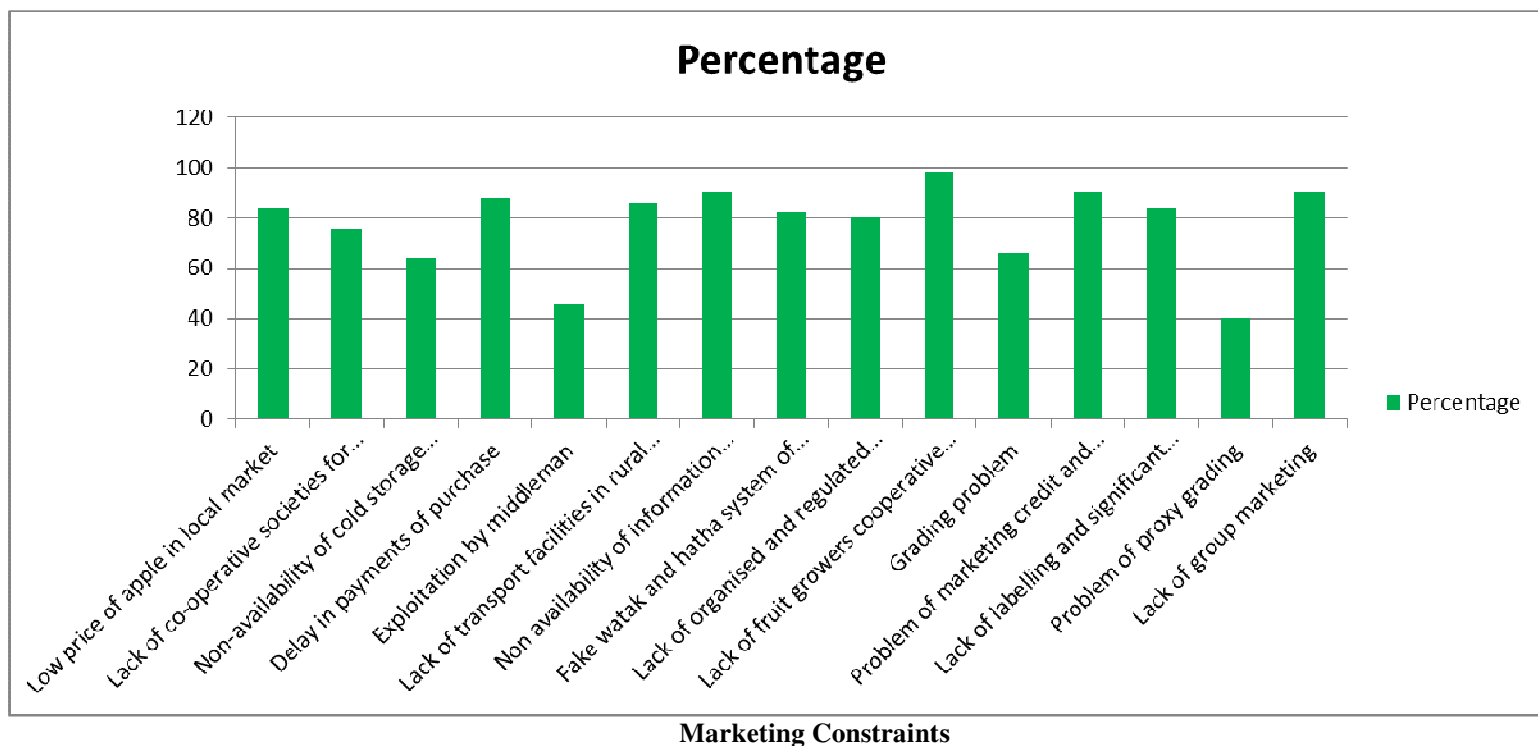
The data presented in Table 5 revealed that among the economic constraints, majority of the registered fruit growers experienced the constraint of high cost of fungicide/pesticide (84%) ranking at number I, high rate of interest on loans (82%) ranking at number II and high cost of boxes (80%) ranking at number III followed by high cost of paddy straw (78%) and high charges of labour (76%) ranking at number IV and V respectively.

4.3.2. Supply Constraints

Data in Table 6 revealed that majority of the registered fruit growers (78%) face the problem of non-availability of labour during harvesting ranking at number I. 74% of the registered fruit growers reported the problem of inadequacy or non-availability of boxes during packing ranking at number II followed by inadequacy of spraying motors on subsidized rates from horticulture department and (62%) and non-availability or inadequacy of recommended pesticide/fungicide (58%).

4.3.3 Marketing Constraints

It is evident from the data presented in Table 7 that a majority of the registered fruit growers (98%) expressed that the main constraint faced by them was lack of fruit grower cooperative marketing societies ranking at number I followed by problem of marketing credit and commission agent monopoly, non-availability of information regarding marketing, lack of group marketing given the same rank II with (90.00%), delay in payment of purchase (88.00%) ranking at number III respectively. The other marketing constraints expressed by the registered fruit growers were lack of transport facilities in rural areas (86.00%), low price of apple in local market, lack of labeling and significant trademark (84.00%), fake watak and hatha system of marketing (82.00%), lack of organized and regulated markets (80.00%) lack of cooperatives for purchase of produce (76.00) ranking at number IV, V, VI and VII respectively. Grading problem (66%), non-availability of cold storage houses (64%), exploitation by middleman (46%)

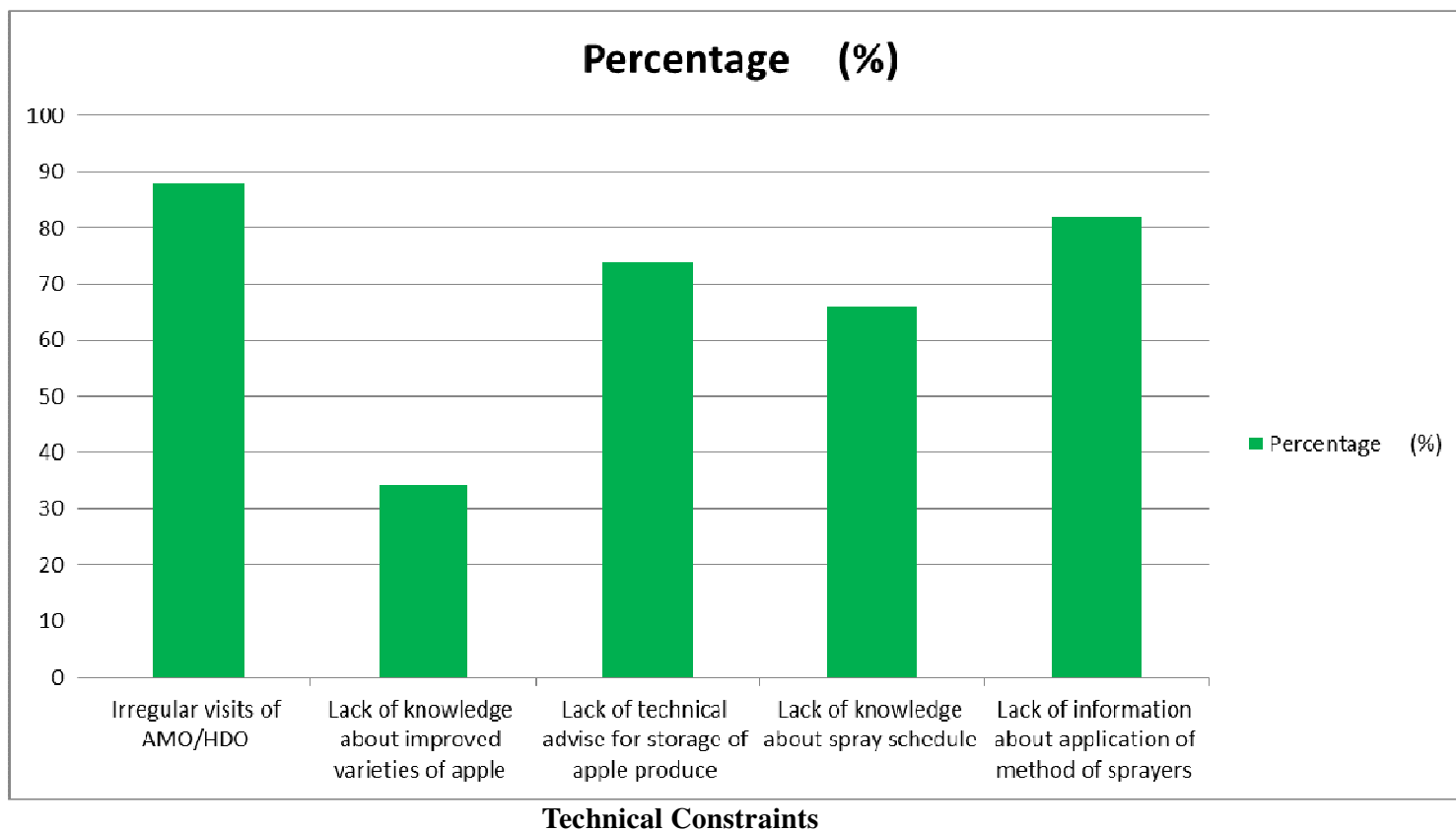


Figure—5 Level of hindrance by various marketing constraints in apple marketing.

problem of proxy grading (40%) were other marketing related constraints and were assigned respective ranks.

4.3.4. Technical Constraints

It is clear from the data in table 8 that majority (88.00%) of registered fruit growers faced technical constraints in adoption of recommended marketing practices. Among the registered fruit growers from Sopore mandi, a majority (88.00%) faced the problem of irregular visits of Area marketing officer and Horticulture developmental officer ranking at number I, followed by lack of information about method of application of sprayers 82% ranking at number II. Lack of technical advice for storage of apple produce (74.00%), lack of knowledge about spray schedule (66.00%) and lack of knowledge about improved varieties of apple (34.00%) were other technical constraints faced by the registered apple growers ranking at number III, IV and V respectively.



Figure— 6 Level of hindrance by various technical constraints in apple marketing

Table-- 5 Economic Constraints encountered by the registered apple fruit growers

S. No	ECONOMIC CONSTRAINTS	(N = 150)		
		Frequency	Percentage	Rank
1	High cost of fungicide/pesticide	126	84	I
2	High rate of interest on loans	123	82	II
3	High charges of labour	114	76	V
4	High cost of boxes	120	80	III
5	High cost of paddy straw	117	78	IV
Multiple responses				

Table-- 6 Supply Constraints encountered by the registered apple fruit growers

S. No	SUPPLY CONSTRAINTS	(N = 150)		
		Frequency	Percentage	Rank
1	Inadequacy of spraying motors on subsidized rates in horticulture deparment	93	62	III
2	Non-availability of labour during harvesting	117	78	I
3	Non-availability of recommended fungicide/pesticide	87	58	IV
4	Inadequacy or unavailability of boxes during packing	111	74	II

Multiple responses

Table--7 Marketing Constraints encountered by the registered apple fruit growers

S. No	MARKETING CONSTRAINTS	(N = 150)		
		Frequency	Percentage	Rank
1	Low price of apple in local market	126	84	V
2	Lack of co-operative societies for the purchase of produce	114	76	VIII
3	Non-availability of cold storage houses in nearby areas	96	64	X
4	Delay in payments of purchase	132	88	III
5	Exploitation by middleman	69	46	XI
6	Lack of transport facilities in rural areas	129	86	IV
7	Non availability of information regarding marketing	135	90	II
Multiple responses				

Contd...

8	Fake watak and hatha system of marketing	123	82	VI
9	Lack of organised and regulated markets	120	80	VII
10	Lack of fruit growers cooperative marketing societies	147	98	I
11	Grading problem	99	66	IX
12	Problem of marketing credit and commission agent monopoly	135	90	II
13	Lack of labelling and significant trademark	126	84	V
14	Problem of proxy grading	60	40	XII
15	Lack of group marketing	135	90	II

Multiple responses

Table: 8 Technical Constraints encountered by the registered apple fruit growers

S. No	TECHNICAL CONSTRAINTS	(N = 150)		
		Frequency	Percentage	Rank
1	Irregular visits by Area marketing officers/ Horticulture developmental officers	132	88	I
2	Lack of knowledge about improved varieties of apple	51	34	V
3	Lack of technical knowledge about storage of apple produce	111	74	III
4	Lack of knowledge about spray schedule	99	66	IV
5	Lack of information about application of method of sprayers	123	82	II
Multiple responses				

Chapter - 5

DISCUSSION

In the present chapter, the research findings of this study presented in the previous chapter are discussed, the logical and rational reasons for the findings are offered. The findings are discussed by keeping the objectives of the present investigation in view. The discussion of the findings of the investigation is presented in the following way.

5.1 Personal and socio economic characteristics of the registered fruit growers, their relationship with knowledge level of the recommended Apple Fruit marketing Practices.

5.1.1 Age

In the present study, it was found that (56.66%) of the registered fruit growers belonged to middle age category in Sopore fruit mandi. A very small percentage (17.34%) of the registered fruit growers belonged to the old age category of 56 years and above in Sopore fruit mandi.

There was a significant relationship between age and knowledge ($r=0.629$). This might be due to the fact that age influences the registered fruit growers' interest in knowing the new things and enhances registered fruit growers' curiosity about scientific ideas and new innovations. Similar results were observed by Reshmy (2001), Lakshmisha (2000).

5.1.2 Education

The present study revealed that 31.33% of the registered fruit growers had 10+2 level education in sopore fruit mandi. 7.33 % of the registered apple growers were graduate and only 4.67 % of registered apple growers were having above graduation level qualification.

Statistically, there was a significant relationship between education and knowledge ($r=0.097$) of the registered fruit growers. This might be due to the fact that education brings about desirable changes in an individual's knowledge, attitude and skill. Higher the education, higher is the knowledge of recommended

apple fruit marketing practices. It seems that comparatively higher education level of registered fruit growers must have enabled them to make use of relevant literature and might have better contacts with extension agency. Similar results were also reported by Yogananda (1992), Balasubramani (1997) and Raghavendra (1999).

5.1.3 Family Size

In the present study, a majority 48.67 % of the registered fruit growers had medium size family (7-10 members) while as, 29.33 % of the registered fruit growers from Sopore fruit mandi had small size family of up to 6 members.

Statistically, there was a non-significant relationship between family size and knowledge ($r=0.412$). The findings are in conformity with the findings of Lakshmisha (2000) and Vedamurthy (2002).

5.1.4 Annual Income

It was observed from the analysis of data that in Sopore fruit mandi, majority of the registered fruit growers (51.33%) had an annual income of Rs. 140001-Rs. 260000 Whereas, thirty nine % of the registered fruit growers had annual income of up to Rs.140001 and below, followed by 9.33% of the registered fruit growers having annual income of Rs.260001 and above.

Statistically, there was a significant relationship between annual income and knowledge ($r=0.729$). The reason may be that the high income registered fruit growers can purchase costly agricultural inputs and implements. Similarly, they have no problem of getting loans and subsidies because of high economic status in the society and develop better contacts with outside world. Thus, annual income is a vital index of social status. s

5.1.5 Land Holding

The present study indicated that in Sopore fruit mandi, sixty % of the registered fruit growers had land holding of up to 1.3 hectare while as nearly 30% of the registered fruit growers had land holding of 1.4 to 2.65 hectare and a very small percentage of the registered fruit growers had land holding above 2.1 hectare. Statistically there was a non-significant relationship between land holding

and knowledge ($r=0.247$). The findings are in the line with the findings of Raut (1985) and Borude (1992). Both the studies yielded that there is no significant relationship between land holding and knowledge.

5.1.6 Experience in Apple growing

In the present study, fifty % of the registered fruit growers of Sopore fruit mandi had an experience of up to 13 years in apple farming. While as, 46 % of the registered fruit growers had experience of apple farming between 14 to 27 years and nearly 3 % of the registered fruit growers from Sopore fruit mandi had experience of 14-27 years.

Statistically, there was a significant relationship between experience in fruit growing and knowledge ($r=0.982$) of the registered fruit growers. This may be due to the fact that the experience lessens the extent of problems and helps in more adoption of the recommended fruit marketing practices as it influences the knowledge and skills of the registered fruit growers for better adoption. The findings are in conformity with the findings of Borude (1992) and Vedamurthy (2002).

5.2 Sources of information

The present study at Sopore fruit mandi reveals that majority (92.00%) of the registered apple fruit growers availed radio as their major source of information being present in almost all households and also being one of cheapest mean of source of information. The study was in line with study of Nagokey (1964).

From table 2, it was observed that 72.66% of the registered apple growers used television as their main source of information. The different marketing related programmes broadcasted on television from time to time have increased marketing knowledge of growers and made growers aware about different prices of apple in various mandi's and acted as main source of information for them. The results are in conformity with the the results of Agrawal and Roy (1980).

It was reported for 69.33% of the registered growers Horticulture development officer have also played a major role in providing knowledge about marketing to

growers to a great extent whenever was contacted by concerned grower. The results were in conformity with results of Ganorkar and Khonde (1979).

It was reported from table 2, that for 60% of the registered apple growers Area marketing officer of the concerned area acted as main source of information for marketing related information. The results were in line with results of Rao and Patel (1966).

From table 2, it was observed for 43.33% of the registered apple growers neighbours acted as their main source of information for marketing of their produce. Similar findings were observed by wilkening in (1952).

From table 2, it was observed that 40% of the registered apple growers used KVK as their source of information for marketing related information with respect to apple produces. The study was in conformity with the results of Ahmad Hussain (1968).

It was reported from table 2, that 36.66% of the registered apple growers that ICT tools have acted as main sources of information, and with the advent of modern technology and apple growers taking advantage of electronic gadgets which provide them time to time market related information. The results were in conformity with study of Rogers in (2013).

For 36.66%, of the registered apple growers Kisan Mela's were used as main source of information. Although kisan mela's are not conducted very frequently but whenever it is conducted marketing knowledge of growers are enhanced to a fairer extent. The results were in conformity with results of Despande (2000).

From table 2, it was reported that for 33.33% of the registered apple growers, progressive farmer influence market information of apple growers. Results were in conformity with results of Campriot and Intodia (1990).

It was reported from table 2, that 22% of the registered apple growers used newspaper as their source of information which has mostly benefited growers who were literate. Timely marketing related information is provided in newspapers. The findings are in line with the findings of Ryan and Rogers (1970).

It was reported from table 2, that for 20.00% of the registered apple growers farmer's friend were used as source of information which influences the market information of apple fruit grower positively. Yogananda (1992) also reported that about 22% of the farmer's friend act as a source of information in marketing the produce.

It was reported from table 2, that for least number of registered apple growers (10.66%) acted as main source of information. Although university were rarely approached by grower to seek market related information but whenever were contacted, growers were duly benefited by scientists. Similar results were observed by Raghavendra (1999).

5.3 Constraints faced by the registered Apple fruit growers in adoption of recommended Apple fruit marketing Practices.

(A) Economic Constraints

Among the economic constraints, 84% of the registered fruit growers from Sopore fruit mandi experienced the constraint of high cost of fungicide/pesticide followed by more than 80% as higher rate of interest on loans while as, nearly eighty % of the registered fruit growers experienced high cost of boxes. High cost of paddy straw was found to be a major economic constraint by (78%) of the fruit growers. High charges of labour were reported by 78% of the registered fruit growers. The study was in conformity with the results found by Mishra (1991).

(B) Supply Constraints

It was observed that more than 78% of registered fruit growers from Sopore fruit mandi reported that they had the problem of non-availability of labour during harvestings. 74% of the registered fruit growers had the problem of non-availability of boxes during packing and inadequacy of spraying motors on subsidized rates by horticulture department (62%). Non availability of recommended fungicide/pesticide was reported to be (58%).The study was in line with the results found by Marsh and Colemon (1985).

(C) Marketing Constraints

Among the marketing constraints (Table 7), more than 98% of the registered fruit growers from Sopore fruit mandi expressed that the main constraints faced by them was lack of fruit growers cooperative marketing societies. The other marketing constraints faced by the registered fruit growers were problem of commission agent monopoly (90%) , non-availability of information regarding marketing (90%) , lack of group marketing (90%), delay in payments of purchase (88%), lack of transport in rural areas (86%), low price of apple in local markets (84%), fake watak and hatha system of marketing, lack of organised and regulated market, grading problem (66%), non-availability of storage houses in nearby area's (64%), exploitation by middleman (46%), problem of proxy grading (40%). Mai-chand (1997) also reported marketing constraints viz., transportation (50%) and unavailability of markets (48.33%), while lack of guidance regarding selection of appropriate cultivars (48.33%), fertilizers application (43.33%) and utilization of culled fruits (43.33%) which is in conformity with our results.

(D) Technical Constraints

With regard to technical constraints, it was observed that among the registered fruit growers from Sopore fruit mandi, more than 85% of the registered fruit growers considered irregular visiting of Area marketing officer/ Horticulture Development Officer as a major technical constraint (88%), lack of information about application of method of sprayers (82%), lack of knowledge about spray schedule (40%), lack of knowledge about improved varieties (34%). The findings of this study are at par with the study conducted by Padma Rao (1997).

Chapter - 6

SUMMARY AND CONCLUSION

6.1 Summary

The age old apple cultivation has profusely coloured the serenity and tranquility of Kashmir landscape. Kashmir apple has lived up to its reputation for being one of the choicest- fruits, Kashmir has for long been considered the home of apples. The chief varieties of apple are found in Jammu and Kashmir. The chief varieties being Delicious, American, Ambri, Moharaji, Kesari, Hazaratbali. Though the cultivation of apple in India is concentrated in Jammu and Kashmir Himachal Pradesh, and Uttar Pradesh yet, Kashmir enjoys the distinction of being still hub of apple industry of the country. This is obviously so because the State has not only superiority over Himachal and Uttar Pradesh in the field of production but also in marketing. The production of apple in the State is confined to six districts of the valley viz., Ananthnag, Baramulla, Budgam, Pulwama, Shopian and Srinagar. However, in Jammu division apple cultivation is found in a limited scale in Doda district only. In district Baramulla the apple cultivation is found on a large scale as district has suitable land for temperate fruits. Apple being state's main fruit has predominant position both in area under plantation and production. Apart from its profitability criteria the horticulture production marketing corporation will bring the horticulture industry of Jammu and Kashmir to an appreciable standard by the introduction of latest technological devices. This would provide export outlets for the quality fruits of Kashmir besides making them available to the local consumers in rest of the country. This step would revolutionize the economic condition of the thousands of growers who in effect form the backbone of the industry. It has been observed in the research areas that maximum growers do not follow market oriented post-harvest operations as advocated by research scientists in their transfer of technology programme to improve the quality of produce in Kashmir Valley. Apple growers are production oriented rather than market oriented. In most cases they follow what other are

doing as a result scarcity or glut of community exists in market resulting lower profits in comparison with other apple producing states like Himachal Pradesh, Uttaranchal, etc. The present study is of great utilitarian value for further improvement in marketing of apple fruit aimed at generating more economic returns. The findings of the study and inference drawn can be generalized for whole valley moreover the constraints faced by the farming community will help us in reshaping the research, extension and needed infrastructure.

Therefore, the present study entitled with the Apple marketing in Kashmir; A case study of Sopore fruit mandi was undertaken with the following objectives.

1. To study the socio-economic characteristics of the apple growers.
2. To evaluate sources of information for marketing decision of apple.
3. To study the constraints faced by the apple growers in marketing and options for policy implications.

With the help of above objectives, a general hypothesis was formulated. The hypothesis was tested in the study. The study was conducted in Sopore fruit mandi of Baramullah district of north Kashmir. These Sopore fruit mandi was selected purposively as this is Asia's second largest mandi and has got hundreds of registered apple growers affiliated with it. The list of the registered apple growers was obtained from the concerned FGA (Fruit growers association).

The data was collected by a well-structured interview schedule and was statistically analysed by using computer facilities (R-software and Microsoft Excel software) to find out association with the help of Karl Pearson's product movement correlation coefficient (simple correlation coefficient) between the characteristics of the registered apple growers with their knowledge of the recommended marketing practices. The personal and socio-economic attributes, namely, age, education, family size, annual income, land holding, experience in apple growing, as independent variables while sources of information of the recommended marketing practices were considered as dependant variables.

6.2 Conclusions

The findings of this study are summarized as under:

1. The highest percentage (56.66%) of the registered apple growers in Sopore fruit mandi belonged to the age group of 39 to 55 years. There was an increasing trend with increase in the age of registered apple growers in respect of knowledge. The correlation coefficient between age and knowledge was significant.
2. The study revealed that more than 84% of the registered apple growers were educated in Sopore fruit mandi. In Sopore fruit mandi highest percentage (31.33%) of the registered apple growers had 10+2 education qualification. Statistically significant correlation coefficient was noticed between education and knowledge level of registered apple grower indicating, thereby, that higher the formal education, higher was knowledge and adoption of the recommended apple marketing practices.
3. It was observed that in Sopore fruit mandi, 46.66% of the registered apple growers had medium family size (7-10 members) while as, 50.66% of the registered apple growers had small family size (up to 6 members). Only 2.66% of the registered apple growers belonged to the large family size (11 & above members). The correlation coefficient between family size and knowledge of the registered apple growers was non-significant.
4. The study denoted that in Sopore fruit mandi, a majority of the registered apple growers (51.33%) had an annual income of Rs 140001 to Rs. 260000. Statistically non-significant correlation coefficient was observed between the annual income and knowledge of the registered apple growers. Also, a non-significant correlation coefficient was observed between the annual income and adoption of the recommended apple marketing practices.

5. Statistically non-significant correlation coefficient was observed between the land holdings of the registered apple growers with their knowledge. In Sopore fruit mandi, a majority (60.00%) of the registered apple growers had small land holding (up to 1.3 hectare).
6. It was observed that in Sopore fruit mandi, more than fifty % of the registered apple growers had experience of 13 years in apple growing. The study has shown a clear and significant relationship between the experience in apple growing and knowledge of the recommended apple marketing practices and also between experience and adoption of the recommended apple marketing practices by the registered apple growers.
7. The present study at Sopore fruit mandi reveals that majority (92.00%) of the registered apple fruit growers availed radio as their major source of information being present in almost all households and also being one of cheapest mean of source of information.
8. The different marketing related programmes broadcasted on television from time to time have increased marketing knowledge of growers and made growers aware about different prices of apple in various mandi's and acted as main source of information for them (72.66%).
9. Horticulture development officer have also played a major role in providing knowledge about marketing to growers 69.33% to a great extent of the registered apple grower whenever was contacted by concerned grower.
10. Area marketing officer of the concerned area also provide time to time marketing related information to growers (60.00%) which were benefited by concerned officer.
11. Neighbours also influence the marketing knowledge of growers to a good extent of the registered apple growers (43.33%)
12. Krishi vigyan Kendra also increased the marketing knowledge of growers 40.00% though growers are hesitant to visit KVK's for

seeking marketing related knowledge but whenever they approach, growers are verily benefited.

13. ICT tools with the advent of modern technology and apple growers 36.66% taking advantage of electronic gadgets which provide them time to time market related information.
14. Kisan Mela though are not conducted very frequently but whenever it is conducted marketing knowledge of growers (36.66%) are enhanced to a fairer extent.
15. Progressive farmer influence market information of growers (33.33%) to some extent.
16. Newspaper has mostly benefited growers (22.00%) who were literate. Timely marketing related information is provided in newspapers.
17. Farmer's friend to a certain extent influences the market information of apple fruit grower (20.00%) positively.
18. University Scientists were rarely approached by grower to seek market related information but whenever were contacted; growers (10.66%) were duly benefited by them.
19. . A statistically significant correlation coefficient was observed between the use of the sources of information and knowledge of the registered apple growers. It can be concluded that more the use of the sources of information, more was the knowledge of the recommended apple marketing practices.
20. The registered apple growers had number of problems pertaining to apple marketing. The important problems reported by majority of the registered flower growers in Sopore fruit mandi were:
 - i. Lack of fruit growers cooperative marketing societies (98.00%) in Sopore fruit mandi.
 - ii. Problems in getting credit (90.00%).
 - iii. Lack of labelling and significant trademark (84.00%)
 - iv. Fake watak and hatha system of marketing (82.00%).

- v. Low rate of apple in the local market in Sopore fruit mandi (84.00%)
- vi. Non-availability of cold storage houses stores in the nearby area's (64.00%).
- vii. Non availability of information regarding marketing (90.00%).
- viii. Lack of organised and regulated markets (80.00%).
- ix. Lack of transport facilities in rural areas (86.00%).
- x. Exploitation by middleman (46.00%)

6.3 Suggestions for the future research

For eradicating the existing ills of the marketing operations of apple, the following suggestions are recommended:

- **Enhancement of Grading and Quality Control Act:** Grading and quality control Act should be executed which should include establishment of grade specification and enforcement of grading programmes, operation of inspection systems and control laboratories. At the same time, grading should be carried out in accordance with the best mechanical devices.
- **Economic Packing System:** An economic packing system for apple should be developed and made easily available for marginal growers of the State.
- **Establishment of Horticulture Marketing Training Institute:** A Horticulture Marketing Training Institute should be established for training and education of personnel engaged in various activities of marketing viz., packing, grading, standardization etc.
- **Improved Marketing Channel:** Efforts should be made to ignore the influence of commission and forwarding agents on apple trade and to establish such a distribution system of fruit as would ensure direct sale to the consumer. This type of marketing channel will be remunerative.
- **Cold Storage Facilities:** Cold storage should also be constructed at export marketing centres so as to ensure the grower of the State the facility of

cold storage at terminal markets when they feel low returns of their produce as result of glut at export marketing centres.

- **Improvement in Transport Facility:** If the apple industry is to be properly developed from all angles, the available transport facilities of every mode have to be improved and expanded suitably.
- **Financial Facilities to the poor Growers:** All State financial agencies should provide loans to basic and poor growers on low interest against their produce. This facility will minimise the practice of supplying interest free finance to the growers by the commission agents and then cheating them by charging abnormally high commission.
- **Establishment of Marketing Information and news Service:** Market information centres should be established which will provide the apple growers and traders day to day knowledge and information about the happenings and trends prevailing in the various marketing centres in and outside the State. Such a facility will help the growers/traders to decide about future market strategy.
- **Educating the Growers:** Adequate arrangements should be made for imparting training and education to the growers so as to equip them to face the marketing challenges. Growers should be trained in the art of bargaining, selling, price fixation and so on.
- **Promotion of Cooperative Marketing:** Cooperative marketing is a unique pattern of marketing where the growers sell their produce to the cooperatives organized with the help of the Government. Although, there are some cooperative societies in the State, these are totally inadequate and inefficient to meet the requirements and demand of the apple industry.
- **Marketing fellowships:** State Government should give fellowships to young growers/traders to study marketing methods and administration in the advanced institutions of learning.

- **Marketing meeting and Training:** Government may recommend personnel/growers to attend specialised horticulture meetings and training course arranged to meet the marketing needs of horticulture sector.
- **Provision of Technical Experts:** The services of horticulture marketing specialists should be offered from other parts of the country to work for some time in a particular area, to analyse problems on this subject and make recommendations to the State in the light of current conditions.
- **Advertising and Publicity:** Advertising and publicity media should be expanded within and outside the country. It is strongly suggested that there should be an international campaign launched by the various concerned State agencies by creating an agency with foreign market association and organisation. Attracting hoarding should be placed at key centres of the principal cities.
- **Research Laboratories:** Horticulture Research laboratories should be established in every Tehsil of the State so that control on pests and diseases may become possible.
- **Exhibition – cum – Demonstration centres/plots:** Classes at mass scale may be conducted by various horticulture departments and institutions in fruit growing areas, where apple growers may be informed about the latest horticulture technology. For this purpose demonstration plots should be set up in fruit producing areas.
- **Publicity and Advertisement Campaign:** A rigorous advertisement campaign should be launched to inform growers about the proper use and relative benefits of fertilizers, so that the habit of use of fertilizers may be developed in the growers.
- **Modern Techniques of Irrigation:** To meet the present requirement of irrigation all methods of irrigation i.e., wells, ditches, storage ponds and river canals etc. should be developed and extended. Merely by extended application of one particular method of irrigation cannot meet the

requirement and demands of irrigation. These are the secret proposals for the healthy operation of the marketing system and for the economic development of apple industry. Therefore, it becomes obligatory on the part of growers and horticulture agencies as well as on the Government to go for these suggestions to correct deficiencies in the existing marketing system/operation of the apple industry. The suggestions, if implemented properly would prove a gate way to the future prosperity of the industry.

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Certificate

Certified that all the corrections/amendments as suggested by External Examiner Dr. Khazir Mohammad Dar, Ex-Associate Professor, Agri-Extension, SKUAST-Kashmir during Viva-Voce examination held on 29-11-2017 have been incorporated in the manuscript entitled “**Apple Marketing in Kashmir: A Case Study of Sopore Fruit Mandi (Terminal Market)**” submitted by **Mr. Aftab Ahmad Khan (Regd. No. 2013-A-966-M)**

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